

PARASITIC BOPYRID ISOPODS OF THE AMPHI-AMERICAN GENUS
STEGOPHRYXUS THOMPSON WITH THE DESCRIPTION OF A
NEW SPECIES FROM CALIFORNIA

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ABSTRACT: *Stegophryxus hyptius*, heretofore known only as a parasite of *Pagurus longicarpus* in New England, is recorded infesting *P. longicarpus* in Georgia, *P. annulipes* in North Carolina and Georgia, and *P. bonairensis* and *P. miamensis* in southern Florida. The only known specimens of *Stegophryxus thompsoni*, the types, from an unknown host in Chile, are redescribed. A new species from California and Baja California, *S. hyphalus*, is described as a parasite of *Parapagurodes laurentae* and *P. makarovi*. These three species, the only members of the genus, are illustrated in detail and their distribution discussed.

Examination of shallow-water hermit crabs collected along the Atlantic coast from Florida to North Carolina has turned up several specimens of the athelgine bopyrid parasite *Stegophryxus hyptius* Thompson, previously known only from New England, thereby providing several new host records and a considerable extension of range for this species. Reexamination of the types of *S. thompsoni* Nierstrasz and Brender à Brandis from Chile, which had not been adequately described, became possible. Numerous parasites of hermit crabs taken off the coast of California and Baja California proved to belong to a new species. With these three species of *Stegophryxus* described, it became possible to review the genus in detail.

The material examined was in or has been donated to the following museums: Allan Hancock Foundation, University of Southern California (AHF); Rijksmuseum van Natuurlijke Historie, Leiden (RMNH); Rosenstiel School of Marine and Atmospheric Science, University of Miami (UMML); United States National Museum of Natural History, Smithsonian Institution (USNM); and Universitetets Zoologiske Museum, Copenhagen (ZMC).

Stegophryxus Thompson 1902

Type-species, by original designation, *Stegophryxus hyptius* Thompson.

Stegophryxus hyptius Thompson 1902
Figures 1-3

Stegophryxus hyptius Thompson, 1902, pp. 53-56, pls. 9, 10.—Richardson, 1904, pp. 59-60; 1905, pp. 532-535, figs. 578, 579.—Rathbun, 1905, p. 48.—

Sumner *et al.*, 1913a, p. 136; 1913b, p. 661.—Kunkel, 1918, p. 236.—Reinhard *et al.*, 1947, pp. 70-72.—Reinhard, 1949, pp. 17-31; 1956, p. 101.—Reinhard and Buckeridge, 1950, p. 131.—Caullery, 1950, p. 97; 1952, p. 76.—Reverberi, 1952, p. 292.—von Brand, 1952, pp. 256, 271, tab. 41; 1966, p. 222, tab. 38.—Florin, 1960, p. 405.—Noble and Noble, 1964, pp. 392, 393, figs. XVI-5A, 5B, 5C.—Smith, 1964, p. 105.—Kaestner, 1970, p. 463.—Bourdon, 1968, p. 133.—Schultz, 1969, pp. 321-322, fig. 513.—Markham, 1972, p. 73.
Stegophryxus hyptius.—Miner, 1950, pp. 450, 453, pl. 145.
Stegophryxus hyptius.—Nierstrasz and Brender à Brandis, 1931, pp. 197-198.
Stegophryxus.—Baffoni, 1953, p. 447.—Reinhard, 1956, p. 93.—Kaestner, 1967, p. 1161; 1970, pp. 425, 463.

Material examined.—Infesting *Pagurus bonairensis* Schmitt, Bear Cut, Virginia Key, Miami, Florida, 9 February 1958, A. J. Provenzano, coll., 1♀, 1♂, USNM 101762. In *Thalassia* bed, shallow water, NW side Virginia Key, Miami, Florida, 25 March 1969, J. C. Markham, coll., 1♀, 1♂ (reference ♀), USNM. Same locality, 8 November 1972, E. B. Hatfield, coll., 1♀, 1♂, AHF. Same locality, 12 February 1973, E. B. Hatfield, coll., 1♀ (reference ♀), 1♂, USNM. Shallow subtidal, off W. Arsenicker Key, Card Sound, Florida, 25 October 1972, E. B. Hatfield, coll., 1♀, 1♂, UMML 32,4538.

Infesting *Pagurus miamensis* Provenzano. In *Thalassia* bed, shallow water, NW side Virginia Key, Miami, Florida, 28 June 1972, E. B. Hatfield, coll., P. A. McLaughlin, identification of host, 1♀, 1♂, UMML 32,4539.

Infesting *Pagurus longicarpus* Say. Tidepool, Sapelo

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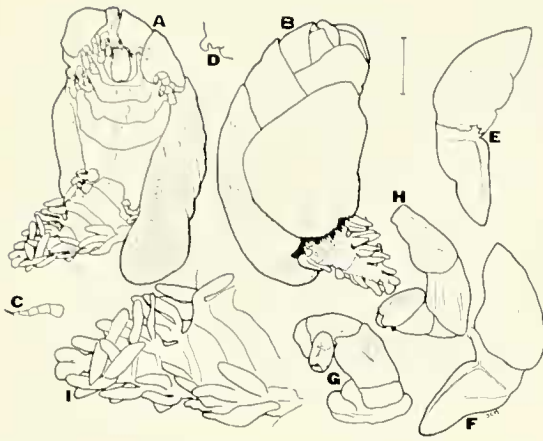


Figure 1. *Stegophryxus hyptius* Thompson, reference female. A. Dorsal view. B. Ventral view. C. Left antenna 2. D. Right posterior ventral border of head. E. Right oostegite 1, interior. F. Same, exterior. G. Right pereopod 1. H. Left pereopod 7. I. Pleon, dorsal view. Scale indicates 1.0mm for A, B, 0.5mm for D-F, I, 0.2mm for C, G, H.

Beach, Georgia, August 1969. R. W. Heard, coll., one immature ♀, 1 ♂, USNM. Woods Hole, Massachusetts, date and coll. unknown, M. J. Rathbun, identification of host, 1 ♀, 1 ♂, USNM 54777.

Infesting *Pagurus annulipes* Stimpson, all hosts identified by P. A. McLaughlin. Morehead Channel, North Carolina. 3 March 1967, R. W. Heard, coll., 3 ♀, 3 ♂, four cryptoniscan larvae, ZMC. Same locality, 25 June 1970, R. W. Heard, coll., 4 ♀, 4 ♂,

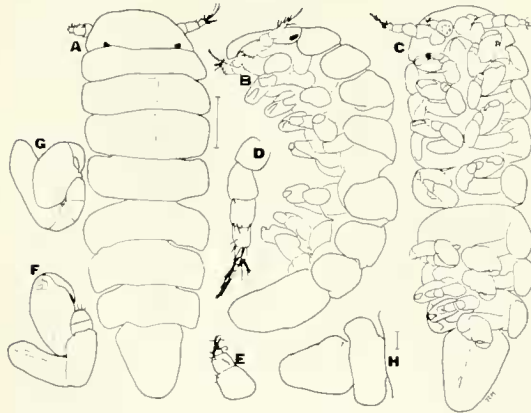


Figure 2. *Stegophryxus hyptius* Thompson, A-G, reference male. H. Second male. A. Dorsal view. B. Lateral view. C. Ventral view. D. Right antenna 2. E. Left antenna 1. F. Right pereopod 1. G. Left pereopod 7. H. Pleon and last pereomere, dorsal view. Scale at B, indicates 0.2mm for A-C, 0.1mm for D-G; scale at H, indicates 0.1 mm for H.

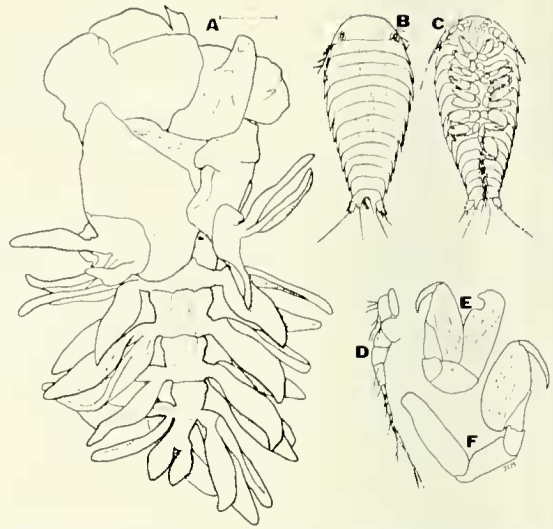


Figure 3. *Stegophryxus hyptius* Thompson. A. Immature female, ventral view. B-F, cryptoniscan larva. B. Dorsal view. C. Ventral view. D. Left antennae. E. Left pereopod 1. F. Left pereopod 7. Scale indicates 1.0mm for A, 0.1mm for B, C, 0.05mm for D-F.

two cryptoniscan larvae, RMNHL. Lacking collection data (probably North Carolina), 1 ♀, UMML 32.4540. Beaufort, North Carolina, 1969 or 1970, C. Kellogg, coll., 1 ♀, 1 ♂, AHF. Same, 1 ♀, 1 ♂, both damaged, UMML 32.4541. Bulkhead Channel, Beaufort Harbor, North Carolina, 22 June 1970, C. Kellogg, coll., 1 ♀, 1 ♂, AHF. Same, 1 ♀, 1 ♂, UMML 32.4542. Beaufort Harbor, North Carolina, 1969 or 1970, C. Kellogg, coll., 1 damaged ♀, AHF.

Remarks.—Thompson (1902) presented a detailed description and excellent drawings of both sexes, an immature female and a cryptoniscan larva of *Stegophryxus hyptius*. Richardson (1905) reproduced Thompson's descriptions and drawings of the adults. There is thus no need to re-describe this species in detail, and a diagnosis should suffice. For comparison, I have presented drawings of both sexes collected in Florida (Figs. 1, 2), an immature female from Georgia (Fig. 3A) and more detailed drawings of a cryptoniscan from North Carolina (Figs. 3B-F).

The characters which distinguish the females of *S. hyptius* (Fig. 1) are a head twice its width, a first oostegite which is bluntly pointed, a highly asymmetrical brood pouch which extends far back on the right side, a pleon which is less than half the total body length and bears very narrow lateral plates and pleopodal rami and enlarged prominent uropods. Males of *S. hyptius* (Fig. 2) are distinctive in having conspicuous eyes, the head clearly

separated from the pereon, and the pleon markedly narrower than the last pereomere, roughly triangular and ending in a rounded point. The immature female of *S. hyptius* can be distinguished by its lack of coxal plates, its elongate pleomeres and very prominent uropods.

Two of the host *Pagurus annulipes*, in addition to bearing mature pairs of *Stegophryxus hyptius* on the abdomen, also bore cryptoniscan larvae on the thorax. On one *P. annulipes* there were two cryptoniscans, one attached to the carapace, the other to a pereopod; on the other *P. annulipes*, three cryptoniscans were clinging to the carapace and a fourth was inside the branchial chamber. These larvae, one of which is pictured (Figs. 3B-F), agree in all respects with those which Thompson (1902) described, even though he found them with the male in the brood chamber of the female *Stegophryxus* rather than on the host's body. I have sent some of these larvae to Jarl-Ove Strömberg of the University of Lund, who plans to examine them with a scanning electron microscope.

One pair of *Stegophryxus hyptius* from *Pagurus bonairensis* was examined while still alive. The female was clinging so tightly to its host's pleopods that one pleopod was torn off in removing the parasite. Its only movement was a constant beating of the anterior oostegites to aerate the larvae filling the closed brood pouch. The male, rather than being in the female's brood pouch, as is typical, was crawling all over its body. The color of the female was transparent to whitish except that dorsally the gut was red-orange and the ovaries yellowish with developing eggs, and there were a few chalky white chromatophores scattered along the sides. The male was transparent except for black eyespots, a brownish gut and a network of interconnecting white lines in all pereomeres and the posterior third of the pleon. A second pair was examined freshly preserved. The female had a uniform glossy white background with brick-red eyes, a pale yellow central dorsal region on the pereon and a few chalky white chromatophores scattered near the edges of the pereon; developing embryos visible through the oostegites bore rows of punctate red chromatophores. The accompanying male was also glossy white with black eyespots, an orange gut and scattered black and white chromatophores.

Previous records of *S. hyptius* are only from Rhode Island and Woods Hole, Massachusetts. At the latter locality it is so common that Reinhard (1949) used it in a classical study to demonstrate

sex determination in the Bopyridae, and Reinhard *et al.*, (1947) made important discoveries about the effects it had on its host, which was always *Pagurus longicarpus*. The new records thus add a considerable extension of range, down to southern Florida, and several new host records, all species of *Pagurus*.

Of the parasites examined, 17 were still with their hosts. Five of these hosts were males, 12 females, the females being hosts significantly more often.

Stegophryxus thompsoni Nierstrasz
and Brender à Brandis 1931
Figures 4-5

Stegophryxus thompsoni Nierstrasz and Brender à Brandis, 1931, pp. 196-198, figs. 87-89.

Material examined.—From unknown hermit crab, Valparaíso, Chile, exact locality and date unknown. Th. Mortensen Pacific Expedition, coll. Holotype ♀, allotype ♂, both damaged. ZMC.

Redescription of holotypic female (Fig. 4).—Body length 8.0mm, maximal body width 3.7mm, head length 1.6mm, pleon length 3.8mm, distortion of body axis 50 degrees. Body badly damaged, so outline uncertain (Fig. 4A).

Head twice as long as wide. Segmentation of antenna 1 uncertain, antenna 2 (Fig. 4B) of five



Figure 4. *Stegophryxus thompsoni* Nierstrasz and Brender à Brandis, holotype female. A. Dorsal view. B. Right antenna 2. C. Right maxilliped. D. Right posterior ventral border of head. E. Right oostegite 1, interior. F. Same, exterior. G. Left pereopod 2. H. Right pereopod 6. I. Pleon, ventral view. Scale indicates 1.0mm for A, C, E, F, 1.0-0.4mm for B, 0.25mm for D, 0.5mm for G, H.

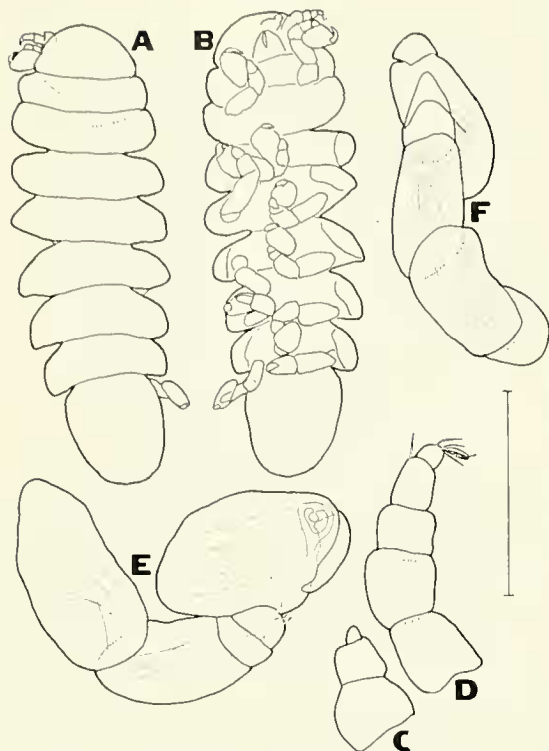


Figure 5. *Stegophryxus thompsoni* Nierstrasz and Brender à Brandis, allotype male. A. Dorsal view. B. Ventral view. C. Left antenna 1. D. Left antenna 2. E. Right pereopod 1. F. Right pereopod 7. Scale indicates 1.0mm for A, B. 0.2mm for C-F.

segments. No eyes. Maxilliped (Fig. 4C) with very irregular outline. Posterior ventral border of head (Fig. 4D) with long pointed lateral projection, irregular blunt process medial to it.

Pereon surrounding head, first two pereomeres obliterated centrally, first five surrounding head, sixth longest. First oostegites (Figs. 4E, F) rounded anteriorly, with dentate internal ridge, sharply angled falcate posterolateral point. Most of other oostegites damaged or missing, so size, shape and position unknown. First five pereopods with prominent coxal plates, sharply reflexed, reduced in size (Fig. 4G); last two pereopods lacking coxal plates, more or less straight, larger (Fig. 4H). Last two pereomeres (Fig. 4I) with medial ventral tubercles near anterior margins.

Pleon nearly as long as pereon, gradually tapering posteriorly, of six pleomeres. Lateral plates and pleopodal rami (Fig. 4I) all about the same size, ovate in outline; evidently pleopods and lateral plates lost from fourth and fifth pleomeres by damage. Uropods uniramous, oval, each nearly as large as whole last pleomere, extending far posteriorly from that pleomere. Tiny posterior point between uropods.

Redescription of allotypic male (Fig. 5).—Body length 2.3mm, maximal body width 0.8mm, head length 0.3mm, pleon length 0.6mm. Sides of body nearly parallel, all segments clearly separated (Figs. 5A, B).

Head semicircular, narrower than pereon. No eyes. Antennae (Figs. 5C, D) of three and five segments, respectively.

Pereon broadest, but only slightly so, across fourth pereomere. All pereomeres separated by slight anterolateral indentations. Pereopods (Figs. 5E, F) gradually smaller posteriorly.

Pleon nearly as broad as last pereomere, barely longer than wide, broadly oval in outline, greatest width about $\frac{1}{3}$ of distance back from anterior edge. No indication of segmentation.

The male has broken into two pieces between the third and fourth pereomeres, and one side of the pleon is damaged, so the drawings presented are partial reconstructions.

Stegophryxus hyphulus, new species

Figures 6-8

?*Stegophryxus* sp.—Menzies and Miller, 1954, pp. 141, 153.

Stegophryxus n. sp.—McLaughlin and Haig, 1973, pp. 119, 134-135.

Material examined.—Infesting *Parapagurodes laurentae* McLaughlin and Haig (part of type series) collected by Allan Hancock Foundation Veleró III among Santa Barbara Islands, California, and near Abrejos Pt., Baja California. Sta. 914-39, 32°47'N, 118°22'W, 143-319m, 19 February 1939, 1♀, 1♂, AHF; Sta. 981-39, 33°35'-35°08'N, 119°01'W, 139-159m, 29 May 1939, 1♀, 1♂, AHF; Sta. 1012-39, 32°46'N, 118°25'W, 100-126m, 9 November 1939, one immature ♀, AHF; Sta. 1028-39, 33°18'N, 118°16'W, 152-229m, 10 December 1939, 1♀, 1♂, ZMC; Sta. 1239-41, 33°01'N, 118°33'W, 95-112m, 22 February 1941, 1♀, AHF; Sta. 1429-41, 33°17'N, 118°16'W, 159-174m, 25 October 1941, 5♀, 1♂, AHF; Sta. 1710-49, 26°17'N, 113°41'W, 99m, 7 March 1949, one immature ♀, USNM; Sta. 1937-50, 34°02'N, 119°27'W, 69-79m, 24 March 1950, one immature ♀, ZMC.

Infesting *Parapagurodes makarovi* McLaughlin and Haig (part of type series) collected by U.S. Bureau of Fisheries Steamer Albatross. Sta. 2946, in Santa Barbara Islands, California, 33°58'N, 119°31'W, 274m, 7 February 1889, 1♀, USNM. Sta. 3184, off Carmel, California, 36°27'N, 122°00'W, 141m, 3 April 1890, 1♀, 1♂, USNM. Collected by Veleró III among Santa Barbara Islands, California, and near San Benito Islands, Baja California. Sta. 911-39, 39°00'N, 118°33'W, 110-155m, 18 February 1939, 1♀, 1♂, AHF; Sta. 981-39, 33°35'N, 119°01'W, 139-159m, 29 May 1939, 7♀ (including one immature), 3♂, AHF; Sta. 983-39, 33°44'N, 119°10'W,

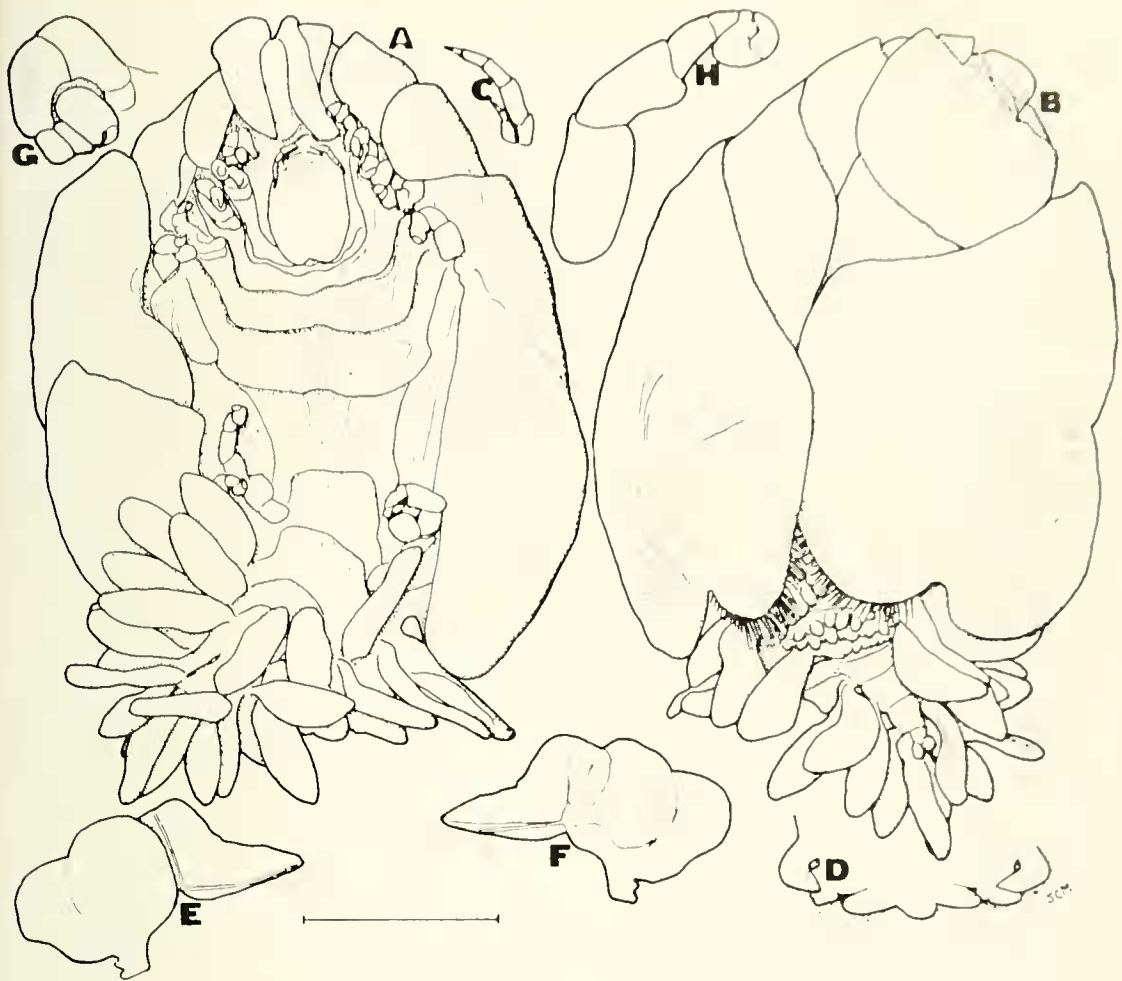


Figure 6. *Stegophryxus hyphalus*, new species, holotype female. A. Dorsal view. B. Ventral view. C. Left antennae. D. Posterior ventral border of head. E. Right oostegite 1, exterior. F. Same, interior. G. Left pereopod 1. H. Left pereopod 6. Scale indicates 2.0mm for A, B. E, F, 1.0mm for D, 0.5mm for C, G, H.

128m, 29 May 1939, 1♀, AHF; Sta. 1018-39, 33° 01'N, 118°32'W, 110-247m, 23 November 1939, one immature ♀, RMNHL; Sta. 1020-39, 33°03'N, 118° 40'W, 247-274m, 24 November 1939, 2♀, 1♂, AHF; Sta. 1026-39, 33°00'N, 118°38'W, 216-384m, 9 December 1939, holotype ♀, AHF 3928, allotype ♂, AHF 3928a, two other ♀, one other ♂, AHF; Sta. 1119-40, 28°13'N, 115°34'W, 159-174m, 19 February 1940, 1♀, UMML 32.4543; Sta. 1173-40, 33° 17'N, 118°14'W, 197-201m, 20 August 1940, 1♀, AHF; Sta. 1393-41, 33°47'N, 119°59'W, 196-229m, 26 August 1941, 1♀, 1♂, RMNHL. Collected by Velero IV near Santa Barbara Island, Sta. 2062-51, 33°33'N-34°33'N, 119°04'W, 256-296m, 18 October 1951, 1♀, 1♂, UMML 32.4544.

Description of holotypic female (Fig. 6).—Body

length 6.1mm, maximal body width 3.2mm, head length 1.2mm, pleon length 2.3mm, distortion of body axis 42 degrees. Body nearly oval in outline (Figs. 6A, B).

Head roughly cordate in shape, about 1.5 times as long as broad. Antennae 1 and 2 (Fig. 6C) of 3 and 5 segments, respectively; each segment smaller than that proximal to it. No eyes. Posterior ventral border of head (Fig. 6D) with raised central portion consisting of a blunt medial point and two laterally directed narrow rounded points; each side bearing a long tapering point laterally with irregularly shaped blunt projection medial to it.

Pereon longer than broad. First five pereomeres concave anteriorly, more or less concentrically surrounding head; first two pereomeres incomplete in

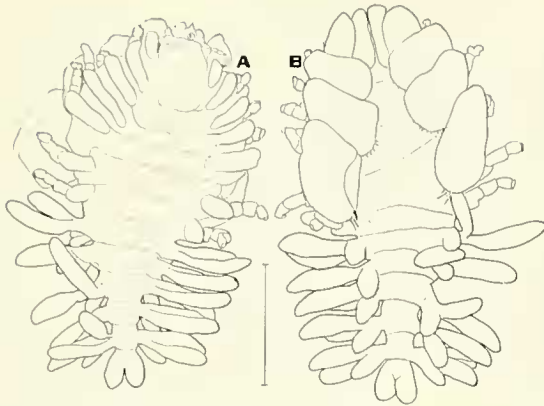


Figure 7. *Stegophryxus hyphalus*, new species, immature female. A. Dorsal view. B. Ventral view. 1.0mm indicated.

center; last two pereomeres concave posteriorly, narrower than others; sixth pereomere by far the longest. First oostegites (Figs. 6E, F) rounded anteriorly, without conspicuous internal ridge in circular middle region, produced into broadly falcate posterolateral point; first two pairs of oostegites arching over head; fifth oostegites by far the largest, covering half of ventral surface, both produced into posterolateral pockets of equal length, posterolateral borders lined with several long setae. Pereopods of first five pairs (Fig. 6G) surrounding head, sharply reflexed; last two pereopods (Fig. 6H) far posterior, longer and straighter than others.

Pleon about $\frac{3}{4}$ as long as pereon, of six pleomeres. Numerous tubercles on ventral surface of first two pleomeres. Sides of pleomeres 1-5 produced into foliaceous lanceolate lateral plates identical to branches of biramous pleopods. Final pleomere bearing small bulbous uniramous uropods.

Variations: Some of the other females examined show a few slight variations from the type. In several cases, the uropods are somewhat longer; in others, the tubercles on the first two pleomeres are either longer and flatter or absent. Ten of the 33 females examined are immature to varying degrees, so remarks on their development are possible. At first, the body is nearly symmetrical, the small oostegites of equal size in each pair, gradually larger from the first to the fifth; the pleon, which is as long as the pereon and not abruptly narrower than it, extends straight back. In the earliest postlarval stages, only the exopodites of the pleopods are developed, the endopodites being small flaps and the lateral plates suggested by tiny bumps. As development progresses (Fig. 7), the branches of the pleopods become equal, while the corresponding lateral plates are still smaller. Other conspicuous differences of the immature females from adult ones are large coxal plates at the bases of all pereopods and much larger uropods.

Description of allotypic male (Figs. 8A-E).—Body length 2.6mm, maximal width 0.6mm, pleon length 0.7mm. Sides of pereon nearly parallel, head and pleon abruptly narrower (Figs. 8A, B).

Head much wider than long, fused with first pereomere. Antennae 1 and 2 (Fig. 8C) of three and seven segments respectively, both bearing many setae on distal segments. No eyes.

Pereon broadest, but only slightly so, across second and third pereomeres. All pereomeres separated by lateral incisions. Pereopods (Figs. 8D, E) all of same size, dactyli progressively smaller and carpi larger posteriorly.

Pleon about $\frac{1}{4}$ length of body, tapering to blunt point. No segments, but undulating margins indicating traces of segments. Appendages lacking. Ventral surface (Fig. 8F) bearing tiny paired slitlike markings.

Variations: Several males have their heads distinctly separated from their pereons, while the pleons of some are quite wide relative to pereonal width. In some cases (Fig. 8G) both of these variations occur.

Etymology.—The specific name *hyphalus* is the Latinized form of a Greek word meaning "submerged" in reference to the consistent occurrence of this species in much deeper water than *S. hyptius*.

Remarks.—*Stegophryxus hyphalus* differs from the other two species of the genus in several respects. The female is similar to that of *S. hyptius*, from which it differs in lacking eyes at all stages, having a much more symmetrical brood pouch, smaller uropods in the adult, more prominent pereopodal coxal plates, shorter pleomeres, and smaller pleonal lateral plates in immature forms. The adult female of *S. hyphalus* differs from that of *S. thompsoni* in having a relatively shorter head and pleon, more broadly pointed first oostegites, less conspicuous pereopodal coxal plates, narrower pleonal lateral plates and pleopodal rami, and much smaller uropods. Males of *S. hyphalus* differ from those of *S. hyptius* in lacking eyes, having pereomeres more strongly separated, and pleon longer, more pointed, and with more undulate margins. The male of *S. hyphalus* may be distinguished from that of *S. thompsoni* by its shorter head and pointed pleon. It is entirely possible that all three species have eyes in both sexes; eyes have been observed only in live or freshly preserved specimens of *S. hyptius*.

The only previous record of a *Stegophryxus* from the coast of California is that listed by Menzies and Miller (1954), who identified the host as a "*Pagurus sp.*" Their key to species indicates that they did indeed have a *Stegophryxus*; most likely *S. hyphalus*. Unfortunately, they list no locality or source for this record.

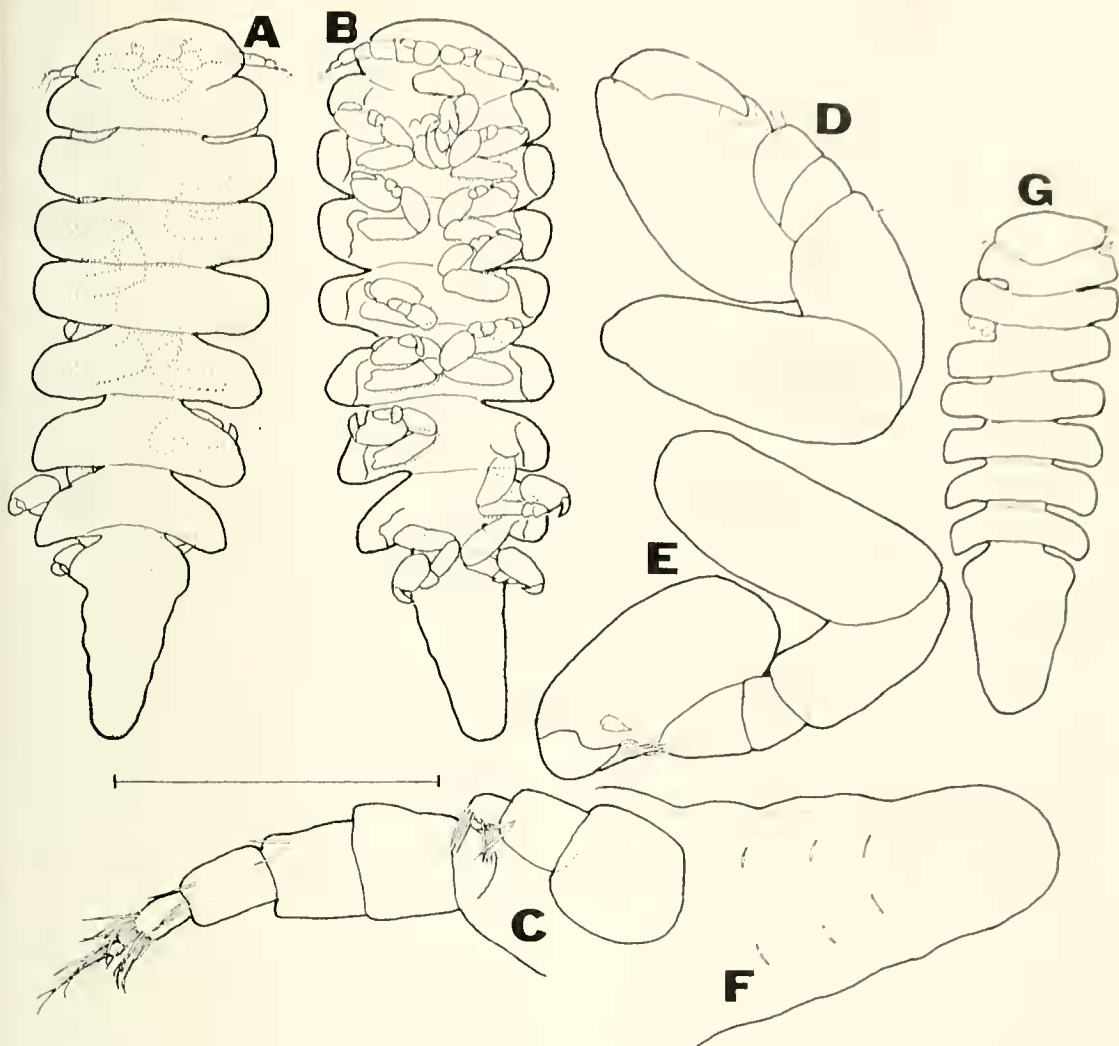


Figure 8. *Stegophryxus hyphalvus*, new species. A-E, allotype male. G, second male. A. Dorsal view. B. Ventral view. C. Right antennae. D. Right pereopod 2. E. Right pereopod 7. F. Pleon, ventral view. G. Dorsal view. Scale indicates 1.0mm for A, B, G, 0.2mm for C, D, E, 0.4mm for F.

DISCUSSION

With the description of three species of *Stegophryxus*, it now becomes possible to provide a generic description, thus: *Female*. Body longer than broad, bent to left so right side is longer; head roughly pyriform with subparallel sides, produced into point anteriorly, indented posterodorsally; first three pairs of oostegites arching far over head, others forming voluminous but tightly closed brood pouch; fifth oostegites much the largest, covering at least half of pereon

ventrally and produced posteriorly into lateral sacs, that on right side extending slightly to greatly posteriorly. First five pereomeres bent around and enclosing head; sixth pereomere much the largest, concave both anteriorly and posteriorly. First two pereopods anterior to head, second two beside it; first five pereopods clustered forward, sharply reflexed, last two far back, more or less straight. Pleon of six pleomeres. First five pleomeres bearing biramous pleopods and lateral plates ranging from linear-lanceolate to subovate by species, all from common peduncle so pleopods

appear "triramous." Terminal pleomere with uniramous bulbous uropods, ranging, by species, from button-like structures to large clubs. *Male*. Body length about three times width, sides nearly parallel except for head and pleon. Head more than twice as wide as long, smoothly rounded anteriorly, usually set off from pereon, or at least lateral indentations indicating separation. All pereomeres separated by deep lateral incisions. Pleon from $\frac{1}{5}$ to $\frac{1}{3}$ total body length, a single fused piece which is narrower than last pereomere, broadest behind anterior edge, rounded to pointed posteriorly. No pleonal appendages.

Three other genera are closely related to *Stegophryxus*, their females being distinguishable from those of *Stegophryxus* by several characters. In *Stegias* Richardson, pereomere 5 is longest, the last oostegites are not produced into posterior sacs, the pleon is relatively much shorter and broader, and the fourth and fifth pleomeres lack lateral plates. There are no markedly elongate pereomeres in females of *Anathelges* Bonnier, the body is nearly as broad as long, and the brood pouch symmetrical. In females of *Pseudostegias* Shiino, the brood pouch does not extend beyond the head, and only the first four pleomeres bear lateral plates. The males of these four genera are more difficult to separate along generic lines.

The distribution and host selection of the species of *Stegophryxus* are quite peculiar. First, this is evidently the only bopyrid genus found on both sides of the Americas and nowhere else. *Stegophryxus hyptius*, throughout its range, infests those species of *Pagurus* which occur on intertidal or shallow subtidal sandy bottoms, even though this range, in covering latitudes from about 26°N to 42°N, goes from an essentially tropical environment to nearly arctic environment. The distribution of *S. hyphalus* is completely different. It infests both known species of the pagurid genus *Parapagurodes* from a depth of 69 to 391m; and thus occurs nowhere close to the intertidal zone. Though the recorded latitudinal range of *S. hyphalus* is from 26°17'N to 36°27'N, there is little difference in temperature at the depths in question. The host and collection depth of *S. thompsoni* are unknown. In their description of this species, Nierstrasz and Brender à Brandis (1931) report: "Valparaiso. Krøyer. Ein Weibchen mit Männchen auf *Pagurus* sp." The label with the types bears the notation "af Pagurid," i.e., "from [a] pagurid," so the genus (and possibly even the family) of the host is uncertain. Janet Haig has kindly examined several

pagurids and diogenids collected off Chile and Peru and reports that none bore any abdominal parasites. As observed in a discussion of *Parathelges* spp. (Markham, 1972), there seems to be little host specificity among athelgine bopyrids. Therefore, it would be impossible to judge what the host of the types of *S. thompsoni* might have been even if more specimens should turn up.

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